DETAILED ACTION

Claim Objection

1. **Claim 17, line 8** recited the optional language "can be distributed". In order to present the claim in a better form and to describe a positive or required steps/functions to be performed, applicant is suggested to revise the claim language such that the steps/functions associated with or which followed "can be distributed" are required and not optional.

Appropriate correction is required.

2. **Claims 17-27 and 30-41** are rejected under 35 U.S.C. 102 (e) by Tundlam et al. (Pub. No.: US 2003/0233472 A1).

Regarding Claims 17, 31 and 41, Tundlam et al. discloses a method for improving traffic distribution (efficient use of multiple paths between switches to distribute the transmission load evenly over multiple paths, paragraph [0005], page 1, lines 1-3; method for distributing data packets within a network node involves the utilization of a weighted function to dynamically distribute the data packets in a balanced fashion, paragraph [0008], page 1, lines 1-4) in a communication network with multipath routing (Fig.2, router 200), wherein in the network traffic to a destination is distributed over a number of routes or paths and forwarded to the destination (router that routes data packets over one or more links and requiring the collection of one or more links between the source and destination, paragraph [0003], page 1, lines 2-7; switch (source) with several ports concurrently sends data packet to a multiplexer which multiplexes to

a transmission line, paragraph [0004], page 1, lines 9-12; multiple paths network switches to distribute transmission load over multiple paths with the assigning of many different destination addresses to the same switch, paragraph [0005], page 1, lines 1-3, 7-8), the method comprising:

providing a plurality of nodes and links (Fig. 2; routers that route data packets over one or more links, paragraph [0003], page 1, line 2) in the communication network, wherein one node of the communication network having a plurality of outgoing links (Fig. 2; routers that route data packets over one or more links, paragraph [0003], page 1, line 2), which correspond to alternative paths for routing to a destination (routing data packets of one or more (alternate) links to send and to deliver the packets to the ultimate destination, paragraph [0003], page 1, lines 4-10) and to which traffic to the destination can be distributed;

assigning to the outgoing links distribution weightings for distribution of the traffic to the destination (routing data packets of one or more links to send and to deliver the packets to the ultimate destination, paragraph [0003], page 1, lines 4-10; switch to distribute the load evenly over the multiple paths, paragraph [0005], page 1, lines 1-3 with load balancing using the distribution ratio (weight) whereby flows are assigned to loaded ports, paragraph [0006], page 1, lines 1-5); and

adjusting the distribution weightings according to a parameter related to the load (load balancing using (and adjusting the) distribution ratio (weight) based on the load where new flows are assigned to the loaded ports, paragraph [0006], page 1, lines 1-5) or availability of the individual links (packet transmission being blocked until the availability of output port (link), paragraph [0005, page 1, lines 15-17; flows assigned to least loaded ports, paragraph [0006], page 1, lines 4-5), with, in the case of two links with different parameter values (load assigned

either overshoot or undershoot the traffic, paragraph [0006], page 1, lines 7-9), the distribution weighting of the link with the higher parameter value being reduced in relation to the distribution weighting of the other link (new flows assigned to least loaded ports and the distribution ratio using the instant load tends to either undershoot the traffic, paragraph [0006], page 1, lines 4-9).

Regarding Claims 18 and 33, Tundlam et al. discloses the method, wherein the distribution weightings are adjusted according to a gap between the parameter for the respective link and a mean value for the parameter taken over the plurality of outgoing links (load balancing (mean value) based on current actual load on each port (link) and (a gap between) new flows assigned to (outgoing links) ports using calculated distribution ratio (weighting) assigning the flows to the least loaded (outgoing links) ports, paragraph [0006], page 1, lines 1-5).

Regarding Claims 19 and 34, Tundlam et al. discloses the method, wherein each of the plurality of links (data packets routed over one or more links delivering the packets to the ultimate destination, paragraph [0003], page 1, lines 2-10), the parameter value (radio matrix recomputed and iteratively ensuring that the flows get distributed evenly across the physical ports, paragraph [0033], page 3, lines 11-15) of which is different from the mean value (load balancing (mean value) based on current actual load on each port, paragraph [0006], page 1, lines 1-5), the distribution weightings are adjusted, with the distribution weightings of links (radio matrix of a load based on the weighted function over a plurality of data ports (links) within the network and distributing data packets to the data ports based on the radio matrix, paragraph [0009], page 1, lines 3-7), the parameter value of which is above the mean value, being reduced (flows assigned

to the least loaded ports, paragraph [0006], page 1, lines 4-5) and the distribution weightings of links, the parameter value of which is above the mean value being increased (distribution ratio overshoots the traffic, paragraph [0006], page 1, line).

Regarding Claims 20 and 35, Tundlam et al. discloses the method, wherein the distribution weightings are increased or reduced in proportion to the gap between the parameter value for the respective link and the mean value (load balancing based on current actual load on each port (link) and (a gap between) new flows assigned to (outgoing links) ports using calculated distribution ratio (weighting) assigning the flows to the least loaded (outgoing links) ports, paragraph [0006], page 1, lines 1-5).

Regarding Claim 21, Tundlam et al. discloses the method according to claim 17, further comprising iteratively adjusting the distribution weightings (adjusting alpha the weighted function gives a wide variation in behavior, paragraph [0028], page 2, lines 5-6), with an adjustment of the distribution weightings being carried out with each step (alpha is an adjustable constant weighted function that ranges in value for the NL_{ave}, P_{ave} and P_{inst} loads on each port, paragraph [0028], page 2, lines 1-4).

Regarding Claims 22 and 37, Tundlam et al. discloses the method, further comprising:

initializing the distribution weightings with start values (alpha, the weighted function ranges from 0.0 to 1.0, paragraph [0028], page 2, lines 3-5);

repeating the iteration (iteratively ensuring the flows get distributed across the ports, paragraph [0033], page 3, lines 13-15); and

using the distribution weightings resulting after the repeated iterations for routing (alpha an adjustable constant weighted function that ranges in value from 0.0 to 1.0 for the NL_{ave}, P_{ave} and P_{inst} loads on each port, paragraph [0028], page 2, lines 1-4; route logic keeps track of the present average and the array average loads on each port, the array is overwritten and contains load distribution among the ports in the router, paragraph [0029], page 2, lines 1-9) in the communication network to the destination (router with one or more links existing in the network routing packets to the ultimate destination, paragraph [0003], page 1, lines 4-10).

Regarding Claims 23 and 38, Tundlam et al. discloses the method, wherein when the distribution weightings are modified (adjusting alpha the weighted function gives a wide variation in behavior, paragraph [0028], page 2, lines 5-6), an attenuation variable that is a function of a number of the iteration is used (radio matrix iteratively used ensured the even distribution of flows across the ports, paragraph [0033], page 3, lines 13-15), bringing about a reduction in the modification of distribution weightings that increases with the number of iterations (adjusting alpha, the weighted function gives a wide variation of behavior from the most stable to the most sensitive with alpha ranging from 0.0 to 1.0, paragraph [0028], page 2, lines 5-7).

Regarding Claims 24 and 39, Tundlam et al. discloses the method, further comprising:

defining the parameter during the first iteration by an absolute traffic load (iteratively using the same ratio matrix ensuring that the flows get distributed evenly across the physical ports, paragraph [0033], page 3, lines 13-15) or a relative traffic load related to a link bandwidth (Fig. 4, bandwidth on the ports, paragraph [0019], page 2, lines 1-2); and

modifying the value of the parameter during the iterations for the next iteration (radio matrix recomputed and iteratively ensuring that the flows get distributed evenly across the physical ports, paragraph [0033], page 3, lines 11-15), with the modification taking into account the traffic transported via the link to the destination (router distributing data packets to each of the plurality of data ports, paragraph [0013], pages 1-2, lines 1-9).

Regarding Claims 25 and 40, Tundlam et al. discloses the method, further comprising adding the traffic transported via the link to the destination multiplied by a factor (NL_{ave}, new average load on each port where alpha (factor) an adjustable constant that ranges in value as used in equation, paragraphs [0027] and [0028], page 2, line 3 and 1-4 respectively).

Regarding Claim 26, Tundlam et al. discloses the method according to claim 17, wherein the traffic distribution in the communication network is recalculated using the resulting distribution weightings (using the calculated distribution ratio, new flows are assigned to ports, paragraph [0006], page 1, lines 3-5).

Regarding Claim 27, Tundlam et al. discloses the method according to claim 17,

wherein the method is implemented for a plurality of nodes in communication network, at which traffic distribution takes place (distributing data packets within a network node involves the utilization of a weighted function to dynamically distribute the data packets in a balanced fashion, paragraph [0008], page 1, lines 1-4; communication network, paragraph [0022], page 2, lines 5-6; Fig.2, router 200; routers that route data packets over one of more links, paragraph [0003], page 1, line 2), and

wherein the method is implemented for a plurality of destinations (router distributing data packets to each of the plurality of data ports, paragraph [0013], pages 1-2, lines 1-9.

Regarding Claim 30, Tundlam et al. discloses the method according to claim 17, wherein the method is implemented in a router (Fig. 2, 200).

Regarding Claim 32, Tundlam et al. discloses the method according to claim 31, wherein the value is based on the availability or load for the corresponding link (radio matrix (value) based on the weighted function of a load over data ports (link), paragraph [0009], page 1, lines 3-5).

Regarding Claim 36, Tundlam et al. discloses the method according to claim 31, further comprising repeating the adjustment step (iteratively using the same ratio matrix ensuring that the flows get distributed evenly across the physical ports, paragraph [0033], page 3, lines 13-15).

3. **Claim 28** is rejected under 35 U.S.C. 103(a) by Tundlam et al. in view of Anderson et al. (Pub. No.: US 2003/0223424 A1).

Regarding Claim 28, Tundlam et al. discloses the method according to claim 17, wherein the parameter is defined by an absolute traffic load (radio matrix based on weighted function of a load over data ports, paragraph [0009], page 1, lines 3-5), a relative traffic load related to the link bandwidth (Fig. 4, bandwidth on the ports, paragraph [0019], page 2, lines 1-2), a traffic-related costs incurred during link usage, a link availability (linked output ports are idle (available), paragraph [0005], page 1, line 18), a transit time of the respective link (after a period of time the array containing load distribution among ports (links) in the router is overwritten, paragraph [0029], page 2, lines 5-9; data streams directed to the corresponding ports (links) based on a predetermined period of time, paragraph [0030], page 3, lines 13-15) or a load capacity (distribute the transmission load evenly over the paths, paragraph [0005], page 1, line 2-3; current actual load on each port, paragraph [0006], page 1, lines 2-3) of the end nodes of the respective link.

Tundlam et al. fails to disclose costs incurred during link usage.

But, Anderson et al. discloses in Fig. 2, cost associated with each path, paragraph [0004], page 1, lines 7-8.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Anderson et al.'s costs incurred during link usage because this would allowed the two paths to have the same cost and the splitting of traffic equally between both paths, paragraph [0004], page 1, lines 8-10.

4. **Claims 29** is rejected under 35 U.S.C. 103(a) by Tundlam et al. in view of Jensen et al. (Pub. No.: US 2003/0198213 A1).

Regarding Claim 29, Tundlam et al. discloses the method according to claim 17,

wherein the distribution weightings of a node to a destination are standardized and this standardization is maintained during modification (distributing data packets within a node involves the utilization of a weighted average (standard) function to distribute the packets in a balanced fashion increasing the overall efficiency of the operation, paragraph [0008], page 1, lines1-8, with router distributing data packets to each of the plurality of data ports, paragraph [0013], pages 1-2, lines 1-9), and

wherein the distribution weightings for multipath routing are adjusted in the context of an ECMP (Equal Cost Multi Path) method.

Tundlam et al. fails to disclose multipath routing of equal cost multipath.

But, Jensen et al. discloses equal cost multi-path routing with link weights, paragraph [0029], page 3, lines 7-8.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Anderson et al.'s multipath routing of equal cost multipath

because this would allowed the routing of traffic with equal weight to be equally utilized, paragraph [00029], page 3, lines 5-7.

Response to Arguments

5. Applicant's arguments filed January 19, 2010 have been considered as follows:

- In the remarks on pages 8-11 of the amendment, applicant contends Tundlam et al. fails to disclose multipath routing as required by the claimed invention.
- The examiner respectfully contends that Tundlam et al. discloses multipath routing in that the router distributing data packets to each of the plurality of data ports, paragraph [0013], pages 1-2, lines 1-9. Further, examiner reiterated that the Foreign Priority document, 10 2004 003 5482 specified in the Oath of Declaration filed, July 20, 2006, was not received by the Patent Office.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON ANDREWS whose telephone number is (571)270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Seema S. Rao/

Supervisory Patent Examiner, Art Unit 2462

LA/la
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